REMARKS

CLAIMS 1, 2, & 5-18

In the Office Action, claims 1, 2, 7-10, 12-14, and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Su et al. (U.S. Patent No. 5,418,717, hereinafter Su) in view of Cohen et al. (U.S. Patent Publication No. 2004/0220892, hereinafter Cohen) and in further view of Deligne et al. (U.S. Patent No. 6,314,399, hereinafter Deligne). Claims 5 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Su in view of Cohen and Deligne and in further view of Komori et al. (U.S. Patent No. 6,662,159, hereinafter Komori). Claim 11 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Su in view of Cohen and Deligne and in further view of Hansen et al. (U.S. Patent Publication No. 2003/0014399, hereinafter Hansen). Claims 15-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Su in view of Cohen and Deligne and in further view of Sumita et al. (U.S. Patent No. 5,907,841, hereinafter Sumita).

Independent claim 1 provides a method of identifying a semantic structure from a text. The method includes identifying semantic entities from the text and combining semantic entities to form at least two candidate semantic structures, each candidate semantic structure having at least one parent semantic entity and at least one child semantic entity. A semantic score is generated for each candidate semantic structure based on the probability of a child semantic entity given a parent semantic entity in the respective candidate semantic structure. A transition score is generated for each candidate semantic structure by generating a separate transition probability for each pair of semantic entities that appear on a same level in a candidate semantic structure wherein generating a transition probability comprises dividing a count of the number of times the pair of semantic entities appear in a particular order on the same level in training data by the number of times the pair of entities appear on the same level in the training data. A syntactic score is generated for each candidate semantic structure based in part on the position of a word in the text and the position in the semantic structure of a semantic entity formed from the word. The syntactic score, transition score, and the semantic score are combined for each semantic structure to select one of the candidate semantic structures for at least a portion of the text.

Claim 1 is not shown or suggested in any of the combinations of cited references. In particular, none of the cited references show or suggest a transition probability that is generated by dividing a count of the number of times a pair of semantic entities appear in a particular order on a same level of training data by a count of the number of times the pair of entities appear on the same level in the training data. In the Office Action, column 3, lines 26-38, of Deligne was cited as showing dividing a count of the number of times a pair of semantic entities appear in a particular order on a same level by a count of the number of times the pair of semantic entities appear on the same level. Applicant respectfully disputes this assertion.

In the cited section of Deligne, initial bigram probability distributions are determined for pairs of sequences of letters in a text. These bigram probabilities are computed as "the counted number of times the two sequences co-occur divided by the counted number of times the first sequence occurs in the input training string." This calculation is shown in more detail in column 21, line 52-column 22, line 10, of Deligne. As shown in columns 21 and 22, the bigram probability is the number of times two elements appear together in a particular order divided by the number of times one of the elements appears in the training data. For example, p(n|o) = nb(on)/nb(o) where nb(on) is the number of times "on" is observed and nb(o) is the number of times just "o" is observed. Note that the denominator, nb(o), does not represent the number of times both "o" and "n" are found together in the string. In fact, the denominator makes no mention of "n". Instead, it only refers to "o". Thus, in determining bigram probabilities, Deligne does not divide by the number of times a pair of semantic entities appear on a same level in training data. Instead, Deligne divides by the number of times one of the semantic entities appears anywhere in the training data. Thus, Deligne does not perform the division described in claim 1.

Further, the probability produced by Deligne would be substantially different from the transition probability described in claim 1, since the transition probability of claim 1 takes into account both semantic entities in the denominator of the division. As such, the probability calculation shown in Deligne does not show or suggest the transition probability of claim 1.

Similarly, none of the other references show or suggest forming a transition probability by dividing the count of the number of times a pair of semantic entities appear in a particular order on a same level in training data by a count of the number of times the pair of entities appear on the same level in the training data. As such, the combination of cited art does not show or suggest the transition score of claim 1 and therefore does not show or suggest the invention of claim 1 or claims 2, and 5-18 which depend therefrom.

CLAIM 11

Claim 11 is additionally patentable over the cited art. Under claim 11, the semantic structures are formed based on relationships between semantic entities that are defined in a schema. In claim 11, this is accomplished by constructing a table with an entry that is indexed by two semantic entities and that contains a set of semantic structures found in the schema. The table is searched using the two semantic entities to locate the set of semantic structures and a semantic structure is formed for each of the semantic structures in the set of semantic structures.

In the Office Action, paragraph 26 of Hansen was cited as showing constructing a table with an entry that is indexed by two semantic entities and that contains a set of semantic structures found in a schema where each semantic structure contains the two semantic entities used to index the entry. Applicant respectfully disputes this assertion.

Paragraph 26 of Hansen describes monitoring search activity in a user population to extract search sessions that include search queries and paths. Semantically related queries are formed into groups and the probabilities that records in a database are relevant to each query are determined. A table associating an index for each record in the database with the probability that the record is relevant for each query or path group is maintained. Thus, in Hansen, query terms are used to locate record URLs related to a query input by a user. URLs are then returned to the user with a weight from the table (see paragraph 61 of Hansen).

The URLs returned by Hansen are not semantic structures found in a schema. Instead they are addresses of pages on a network. Further, Hansen does not show or suggest forming a semantic structure for each semantic structure in the set of semantic structures. Instead, Hansen merely returns the URLs. The URLs themselves are text representing an address of a page. Displaying such URLs does not involve forming a semantic structure. Further, the URLs do not necessarily contain the query terms in Hansen. Instead, they merely point to a page that contains the query terms. Hansen does not show or suggest forming such pages. Instead, it simply returns the URLs of those pages.

Since Hansen does not show or suggest constructing a table that contains a set of semantic structures found in a schema and that is indexed by two semantic entities, and since Hansen does not show or suggest forming a semantic structure for each semantic structure in a set of semantic structures that is located using two semantic entities, the combination of cited art does not show or suggest the invention of claim 11.

CLAIMS 19-26 & 29-31

Claims 19-26 and 29-31 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Su in view of Sumita.

Claim 19 provides a computer-readable medium having computer-executable instructions for performing steps. The steps include identifying semantic entities from a text by creating semantic nodes and adding semantic entities identified from the text to the semantic nodes. A set of partial semantic structures is formed from the semantic entities at a semantic node. Each of the partial semantic structures is scored to provide a score for each partial semantic structure. At least one partial semantic structure is pruned and at least one partial semantic structure is retained based on the scores for the partial semantic structures. A full semantic structure is formed from a retained partial semantic structure and semantic entries in a semantic node. A determination is made that there are no more semantic nodes to process. A further determination is made that the full semantic structure is not a command semantic structure. The full semantic structure is then placed in multiple command semantic structures after determining there are no more semantic nodes to process and after determining that the full semantic structure is not a command semantic structure. Each command semantic structure is scored and one of the command semantic structures is selected based on the scores

Claim 19 is not shown or suggested in the combination of Su and Sumita. In particular, neither reference shows or suggests placing a full semantic structure in multiple command semantic structures after determining there are no more semantic nodes to process and after determining that the full semantic structure is not a command semantic structure. In the Office Action, it was asserted that Sumita shows the step of placing a full semantic structure in multiple command semantic structures in column 14, lines 1-17. Applicant respectfully disputes this assertion.

As described in column 3, lines 45-55, Sumita determines the semantic structure of an input user query, then compares the semantic structure to semantic structures formed from stored documents. The stored documents that have the best matching semantic structure are then returned to the user.

In column 14, lines 1-17, Sumita describes this comparison between the semantic structure of an input character string and the semantic structures of all the documents in a document database so as to obtain those documents which have the same semantic structure as the input character string.

Sumita makes no mention of placing one semantic structure in multiple command semantic structures. Further, Sumita does not mention placing a full semantic structure in multiple command semantic structures after determining there are no more semantic nodes to process and after determining that the full semantic structure is not a command semantic structure. Instead, Sumita simply compares an input semantic structure to semantic structures for stored documents to determine which documents are most relevant to an input string. This comparison does not involve placing one semantic structure in another semantic structure. Instead, Sumita is simply making a comparison between semantic structures to identify the most relevant documents.

Similarly, Su does not place a semantic structure into multiple command semantic structures. As such, the combination of Su and Sumita does not show or suggest the invention of claim 19 or claims 20-26 and 29-31, which depend therefrom.

CONCLUSION

In light of the above remarks, claims 1, 2, 5-26, and 29-31 are in form for allowance. Reconsideration and allowance of the claims is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By:________________________

Theodore M. Magee, Reg. No. 39,758
900 Second Avenue South, Suite 1400
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 334-3312

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